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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,285	07/08/2003	Ajit Shankaranarayanan	GEMS8081.175	1284

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EXAMINER
HORWAT, JENNIFER A

ART UNIT	PAPER NUMBER
3768	

DATE MAILED: 06/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/604,285	SHANKARANARAYANAN ET AL.	
	Examiner	Art Unit	
	Jennifer Horwat	3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-10,12-17 and 19-22* is/are rejected.

7)☐ Claim(s) *6,11 and 18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/27/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. In regards to claims 1-5, 7, and 9, applicant's arguments filed 3/2/2006 have been fully considered but they are not persuasive. The addition of the limitation "within an optimal imaging volume" to the claim does not distinguish claim 1 over the prior art of record. As applicant states in the remarks filed, Machida teaches that the imaging range is the entire uniform region in the static magnetic field (paragraph 57). However, Machida distinguishes an imaging slice from the imaging range as the slice which is selectively excited in consideration of a moved position according to the sequencer timing. The preparation pulse is applied outside the imaging slice, but within the imaging volume, as shown in figure 7a.

2. In regards to applicants In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., that the contrast will be different across slices) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

3. Applicant's arguments, see remarks in the response to non-final rejection, filed 3/2/2006, with respect to the rejection(s) of claim(s) 6-22 under Machida have been fully considered and are persuasive. Therefore, the rejection has been withdrawn.

However, upon further consideration, a new ground(s) of rejection is made in view of Kimura (US 6564080).

Claim Rejections - 35 USC § 102

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1-5, 7, and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Machida (US 2002/0115929). Machida discloses all of the limitations in the above-mentioned claims in a magnetic resonance imaging system for slice selective excitation in which the patient support table translates (figure 1, element 17 and paragraph 5) continuously through the system. The system has a plurality of gradient coils (figure 1), an RF transceiver (figure 1, elements 8R and 8T) to acquire MR images, and a computer (figure 1, element 6). A preparation pulse may be employed (paragraph 103) which is applied to the slice to selectively excite the region of interest one slice at a time. The preparatory excitation pulse is repeated before each of the slices is translated one slice thickness (figures 4a-4d). The excited slice has the same width as the fixed imaging slice (figures 4a-4d) and the subject is translated continuously through the imaging volume so that each slice is selectively excited and then imaged as it is translated. The preparation pulse is offset as a function of translation direction and is offset in the direction opposite that of translation, inherent in the fact that the preparation pulse is applied prior to imaging. A gradient echo sequence may be used (paragraph 88), such as an echo planar imaging system sequence. The computer provided,

including a sequencer, a calculator, storage, and a display, and an input unit (paragraph 45) allows the calculations and method steps previously described to be calculated and executed.

6. Claims 10, 12-15, 17, 19, 20, and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Kimura (US 6564080). Kimura discloses a system for magnetic resonance including gradient coils to spatially encode spins and an RF to acquire MR images. Further, Kimura discloses a system which includes a computer which allows a user to input a preparation interval, Gaptag, which is the spacing between a tagging inversion recovery pulse and an image acquisition pulse (figure 4, step 31). In this instance, the subject being continuously translated through the imaging volume is one-way blood flow, as shown in figure 1. The frequency offset is calculated (figure 4, step 32) from the input parameters including the preparation interval. The preparation interval is applied in the direction opposite of subject translation. The process is repeated, including application of the preparation pulse for separate slices, as is inherent in obtaining slices of image data for reconstruction (figure 4, step 36). Any type of fast-imaging pulse sequence may be used as long as T1 time can be enhanced, which includes a gradient-echo sequence (col 14, lines 35-40). Either an inversion recovery pulse or a saturation pulse may be used (col 21, lines 46-52). The distance spins of the prepared tissue will travel while translated through the imaging volume is determined depending on translation speed, the inversion time, along with other parameters (col 4, lines 23-27). The technique disclosed images in single slices,

however an improved technique is disclosed which enables multi-slice imaging (col 2, lines 29-31).

Claim Rejections - 35 USC § 103

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Machida in view of Kimura. Machida, as discussed above, substantially discloses the invention as claimed, however fails to disclose specifically using an inversion recovery pulse as the preparation RF pulse, which will have a flip angle of 180 degrees. Machida, however, states that the technique disclosed is able to employ a variety of preparation pulses (paragraph 103). A variety of pulses are well known in the medical imaging field and it is common to use an inversion pulse to reset or restore the state of the system. Kimura discloses using a 180 degree inversion pulse as a preparation pulse (figure 1) in which the column to be inverted is always spaced ahead of the column to be excited. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Machida with the teachings of the reference by Kimura, as Kimura discloses methods to effectively image a subject undergoing continuous motion.

9. Claims 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura in view of Machida. Kimura, as discussed above, substantially discloses the invention as claimed, however fails to explicitly disclose changing the preparation sequence and that slice thickness of the preparation and imaging volumes. Machida

also discloses a system using a preparation pulse and an imaging pulse to acquire images of a continuously moving volume and further discloses that the offset frequency changes, as it is dependent on the moving speed of the tabletop (paragraph 7), which is not a constant value. Additionally, the excited slice has the same width as the fixed imaging slice (figures 4a-4d) and the subject is translated continuously through the imaging volume so that each slice is selectively excited and then imaged as it is translated. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Kimura in light of the teachings in the reference by Machida, as Machida states making this adjustment enables the position of a selectively excited slice to be tacked during continuous movement of an object.

Allowable Subject Matter

10. Claims 6, 11, and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer Horwat whose telephone number is (571) 272-2811. The examiner can normally be reached on M-Th 7-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eleni Mantis-Mercader can be reached on (571) 272-4740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

jah
5/25/2006

BRIAN L. CASLER
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TECHNOLOGY CEN[illegible]